

REPLACED BY
ART 34/AMDT

The above solution however is a relatively low pressure device, in which the water driving the fluid driveable engine flows fairly slowly (of order 5 m/s) in comparison with what is commonplace in a typical hydroelectric installation. This speed cannot be significantly increased by constricting the pipe diameter without
5 introducing punitive power losses, and so only a low speed water turbine can be driven by this device. Such a turbine is not well matched to the requirements of an electrical generator, which may run at typically 1500 rpm. In order to supply a useful electrical output, a large and expensive gearbox would be needed.

WO 99/66200 discloses an embodiment of the above invention in which an
10 alternative fluid to that present in the fluid flow is used to drive the fluid driveable engine, providing a solution to these problems, but only at the expense of increasing the complexity of the apparatus and necessitating the inclusion of sealed containers underwater near to the fluid flow.

Various respective aspects and features of the invention are defined in the
15 appended claims.

According to one aspect of the present invention there is provided an apparatus for extracting power from a fluid flow, the apparatus comprising a fluid driveable engine, and a conduit, disposed to enable fluid communication between a portion of the fluid flow, the fluid driveable engine and a transmission fluid, the fluid in the fluid
20 flow and the transmission fluid being different fluids and the portion of the fluid flow being at a lower pressure than the transmission fluid by virtue of its flow rate, thus causing the transmission fluid to be drawn through the conduit to become entrained in the fluid flow, the fluid driveable engine being arranged such that the flow of the transmission fluid along the conduit acts to drive the fluid driveable engine.

25 The apparatus of the present invention alleviates the disadvantages of the prior art by enabling an alternative fluid to that present in the fluid flow to drive the fluid driveable engine without the need for additional active components such as valves and large underwater structures such as containers. The use of an alternative fluid as the drive fluid enables appropriate fluids to be chosen to provide advantages such as a
30 reduction in frictional losses and/or reduction in corrosion or erosion suffered by the device.

CLAIMS

1. An apparatus for extracting power from a fluid flow, the apparatus comprising:
5 a fluid driveable engine,
a conduit, disposed to enable fluid communication between a portion of the fluid flow, the fluid driveable engine and a transmission fluid, the fluid in the fluid flow and the transmission fluid being different fluids and the portion of the fluid flow being at a lower pressure than the transmission fluid by virtue of its flow rate, thus
10 causing the transmission fluid to be drawn through the conduit to become entrained in the fluid flow, the fluid driveable engine being arranged such that the flow of the transmission fluid along the conduit acts to drive the fluid driveable engine.
2. Apparatus as claimed in claim 1, comprising:
15 at least one fluid directing formation formed to define a channel in the fluid flow having a flow accelerating constriction shaped such that the fluid in the channel is caused to accelerate as it flows through the flow accelerating constriction of the channel.
- 20 3. Apparatus according to claim 1, in which the fluid flow comprises a flow along a conduit between two positions in a fluid stream, a conduit inlet position being at a higher fluid pressure than a conduit outlet position by virtue of a higher stream velocity at the conduit outlet position.
- 25 4. Apparatus according to claim 3, comprising a fluid directing formation for constricting the fluid stream at the conduit outlet position with respect to the fluid stream at the conduit inlet position.
5. Apparatus as claimed in any one of the preceding claims, wherein the fluid
30 flow comprises a flow of water.

6. Apparatus as claimed in any one of the preceding claims, wherein the transmission fluid comprises air.
7. Apparatus according to any one of the preceding claims, in which the fluid
5 driveable engine comprises a turbine.
8. Apparatus according to claim 7, comprising a heat exchanger in the transmission fluid flow path at a transmission fluid exhaust of the turbine.
- 10 9. Apparatus according to claim 8, in which the heat exchanger is arranged to cool the transmission fluid.
10. Apparatus according to claim 8, in which the heat exchanger is arranged to cool a further transmission fluid in communication with external plant.
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11. Apparatus according to claim 8, in which the heat exchanger is arranged to condense water vapour from ambient air.
12. Apparatus for extracting power from a fluid flow, the apparatus being
20 substantially as hereinbefore described with reference to the accompanying drawings.